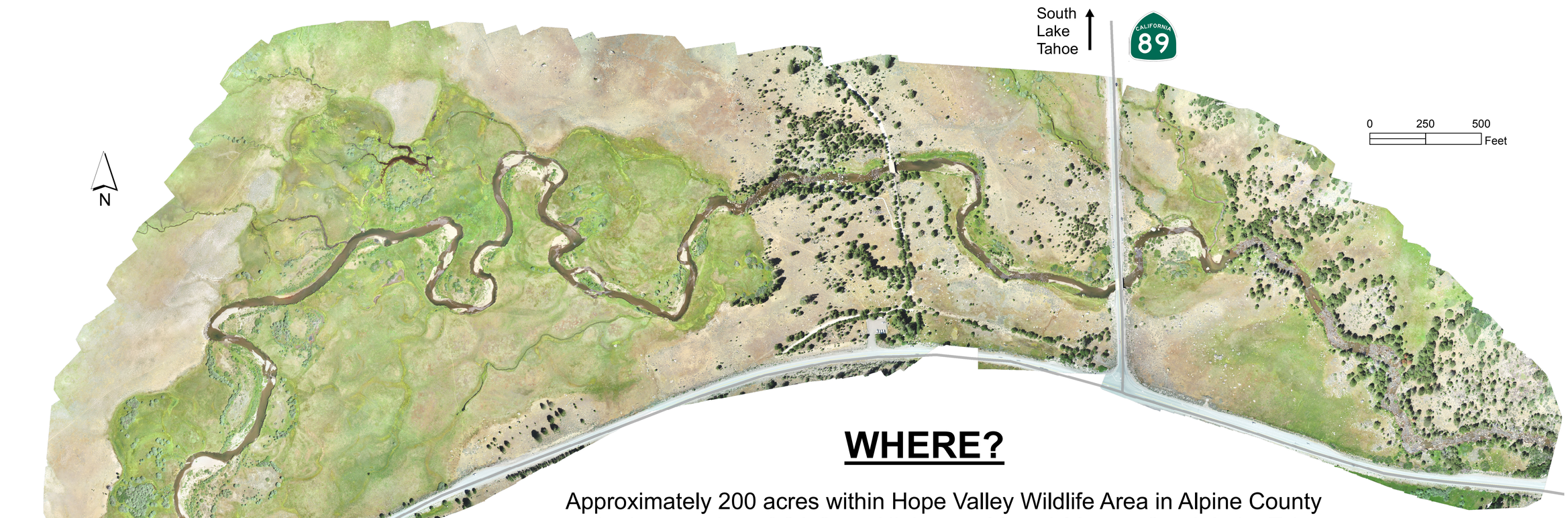
Drone Products for Hope Valley Wildlife Area by the California Department of Fish and Wildlife (CDFW)

WHAT?

CDFW used a drone to acquire 1 inch pixel resolution orthoimagery and related products for a portion of Hope Valley Wildlife Area on July 25th, 2018. The full extent of the orthoimagery is shown below.



WHERE?

Approximately 200 acres within Hope Valley Wildlife Area in Alpine County at the intersection of CA State Highways 88 and 89 near South Lake Tahoe.

HOW?

Drone Equipment:
DJI Phantom 4 Pro quadcopter
Flight altitude 300 feet
Map Pilot app (Drones Made Easy)
Apple iPad Mini 4 (128 GB RAM)
Hoodman Launch Pad

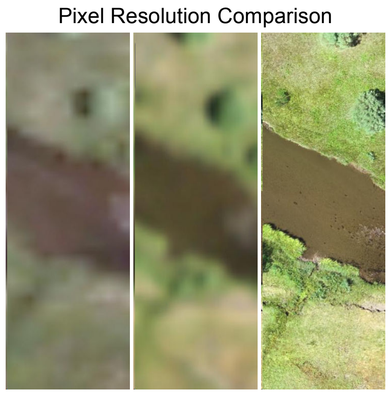
Approach:
To avoid flying over bystanders, notices about the drone flights where posted ahead of time and CDFW staff scouted and cleared areas immediately prior to the flights. To improve horizontal and vertical accuracy, ground control point (GCP) targets were also distributed around the project area and their X, Y, Z coordinates measured with Trimble GPS/RTK equipment.

Processing:
About 1800 drone-captured photos, including GCP links where possible, were processed using Esri Drone2Map software to create orthoimagery, elevation models, and 3D meshes. Additional processing was done using ArcGIS Desktop and products uploaded to ArcGIS Online. Positional accuracy is generally within 6 inches.

WHY?

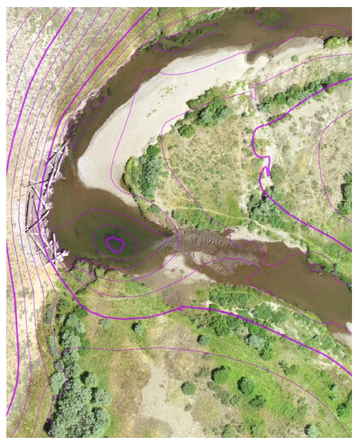
The drone imagery is being used to assist with revetment projects, elevation mapping, and visualization of the West Carson River and its floodplain. The drone imagery is more detailed than commonly available aerial imagery for rural areas (such as NAIP) and also provided elevation products and data for 3D modeling.

Pixel Resolution Comparison

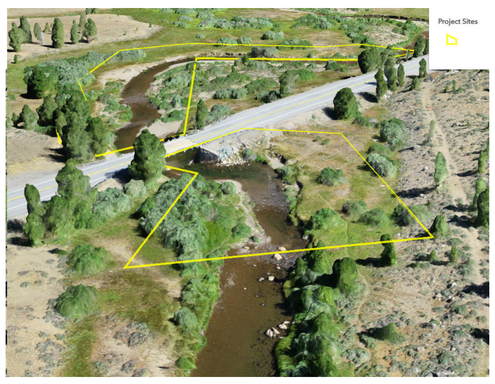


NAIP 2010 1 meter | NAIP 2016 60 cm | Drone 2018 1 inch

River bank change showing 2018 drone imagery superimposed on 2005 NAIP imagery as well as bank demarcations for intervening years



Elevation contours produced from drone-derived elevation model



Above: Photorealistic 3D models produced from drone meshes to visualize project sites

Below: Drone orthoimagery enhanced with digital surface model relief

Orthoimage

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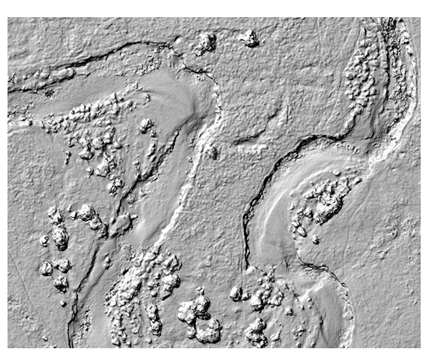

Surface Model Hillshade/Relief

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Relief-Enhanced Orthoimage

WHO?

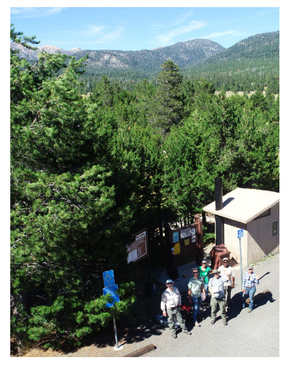
CDFW Staff:

Coordination:
William (Bill) Somer
Shelly Blair

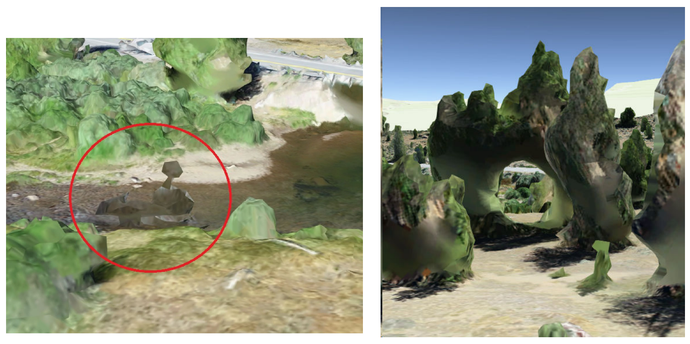
Drone Services:
(Under FAA Part 107)
Will Patterson
Dan Orr

GPS/RTK Services:
Jon Mann
Will Patterson

Field Help:
Lauren Pilatti
David Mollel



WHOA!?



A new freshwater species? A drive-through tree?
More likely just 3D processing artifacts

MORE INFO?

Explore the project drone data and documentation through a 2D web map or a 3D web scene, both publicly available through ArcGIS Online and accessible via the following links and QR Codes:

2D Web Map
https://arcg.is/1Lr5ny

3D Web Scene
https://arcg.is/18ym1z

Will Patterson 2018.10b
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